REMARKS

A.   Background

Claims 1-10, 12, 14-16, and 50-54 were pending in the application at the time of the Office Action. Claims 1-10, 12, 14-16, and 50-54 were rejected as being obvious over cited art. Claims 11, 13, and 17-49 were cancelled in earlier papers. By this response Applicant has not cancelled, amended, or added any claims. As such, claims 1-10, 12, 14-16, and 50-54 are again presented for the Examiner's consideration in light of the following remarks.

B.   Rejection of the Claims

Pages 2-10 of the Office Action reject claims 1-7, 9, 10, 14-16, and 50-54 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,501,776 to Numai ("*Numai*") in view of U.S. Patent No. 6,580,740 to Funabashi et al. ("*Funabashi*") and further in view of U.S. Patent No. 5,155,737 to Ikeda et al. ("*Ikeda*"). Of the rejected claims, claims 1-3, 5, and 6 are independent claims. Applicant respectfully traverses this rejection and submits that even if the references were combined in the allegedly obvious manner set forth in the Office Action, the proposed combination of *Numai, Funabashi*, and *Ikeda* would <u>not</u> include all of the limitations recited in the rejected claims.

Numai discloses a temperature-insensitive semiconductor laser having an active layer 23 (which the Office Action equates to the "gain region" recited in the rejected claims) and a distributed Bragg reflector (DBR) (which the Office Action equates to the "reflection region" recited in the rejected claims). *Numai* discloses that the DBR includes a diffraction grating. See col. 4, lines 21-29.

Funabashi is cited for teaching "a gain region comprising a diffraction grating formed by periodic perturbation with at least one of real and imaginary parts of a complex refractive index." The Office Action concedes that neither *Numai* nor *Funabashi* teaches "the coupling coefficient of the diffraction grating of the gain region being greater than 300 cm^{-1}," and points to *Ikeda* to remedy this deficiency. Specifically, the Office Action asserts that *Ikeda* teaches "a diffraction grating with a very high coupling coefficient, greater than 300 cm^{-1}." See p. 3 of the Office Action.

As shown in Figure 1A, *Ikeda* discloses a semiconductor wavelength conversion device having a gain region 4. Distributed Bragg reflectors 11 and 5 are respectively positioned before and after gain region 4. *Ikeda* discloses that DBR 11 "has a large coupling coefficient." Col. 5, line 32. In discussing this DBR coupling coefficient, Ikeda discloses that DBR 11 includes a corrugation grating having a "coupling coefficient ... [that] is very great, i.e., of the order of 300 cm^{-1}." *Ikeda* also discloses lesser values of coupling coefficients for DBRs 5 and 11, such as 30 cm-^{1} and 150 cm^{-1}. See col. 6, line 64 to col. 7, line 4. Applicant notes that <u>the disclosed coupling coefficients relate only to the DBRs; *Ikeda* is silent as to any possible coupling coefficient values for gain region 4</u>.

Thus, although *Ikeda* teaches a coupling coefficient "of the order of 300 cm^{-1}," this refers to the coupling coefficient <u>of the DBR, and not of the gain region</u>. As such, even if, *arguendo*, it would have been obvious to incorporate this coupling coefficient teaching of *Ikeda* into *Numai* and *Funabashi*, the resulting combination would at most include a DBR having a coupling coefficient of 300 cm^{-1}. And as noted above, the Office Action equates the DBR of *Numai* to the "reflection region" recited in the rejected claims, an element separate and distinct from the "gain region." Consequently, the allegedly obvious combination would <u>not</u> include the limitation that

"the coupling coefficient of the diffraction grating of said gain region is greater than 300 cm^{-1}," as recited in each of the rejected independent claims 1-3, 5, and 6.

In view of the foregoing, Applicant submits that the Office Action has failed to establish a *prima facie* case of obviousness because the Office Action has failed to establish that the allegedly obvious combination teaches each and every limitation recited in the rejected claims. Accordingly, Applicant respectfully requests that the obviousness rejection of independent claims 1-3, 5, and 6 be withdrawn.

Claims 4, 7, 9, 10, 14-16, and 50-54 depend from claims 1-3, 5, and 6 and thus incorporate the limitations thereof. As such, Applicant submits that claims 4, 7, 9, 10, 14-16, and 50-54 are distinguished over the cited art for at least the same reasons as discussed above with regard to claims 1-3, 5, and 6. Accordingly, Applicant respectfully requests that the obviousness rejection with respect to claims 4, 7, 9, 10, 14-16, and 50-54 also be withdrawn.

Pages 10-12 of the Office Action reject claims 8 and 12 as being unpatentable over the *Numai/Funabashi/Ikeda* combination, discussed above, further in view of U.S. Patent No. 4,583,227 to Kirkby ("*Kirkby*") (claim 8) or U.S. Patent No. 5,719,974 to Kashyap ("*Kashyap*") (claim 12). *Kirkby* is merely cited for allegedly teaching "an absolute value of a product of a length of said propagating region and a difference between a temperature differential coefficient of the effective refractive index of said gain region and a temperature differential coefficient of the effective refractive index of said propagating region is equal to or greater than 7.5×10^{-4} μm/K." *Kashyap* is merely cited for allegedly teaching "the length of said propagating region is determined such that a longitudinal mode spacing determined by a sum of an effective length of the diffraction grating of said gain region and a length of said propagating region, is greater than a stop bandwidth of said diffraction grating." Applicant respectfully traverses these rejections.

Claims 8 and 12 depend from claim 1 and thus incorporate the limitations thereof. As such, even if, *arguendo*, it would have been obvious to combine *Numai/Funabashi/Ikeda* with the aforementioned teachings of *Kirkby* or *Kashyap* in the allegedly obvious manners set forth in the Office Action, the resulting combinations would still not cure the deficiencies of *Numai/Funabashi/Ikeda* with regard to claim 1. As such, applicant submits that claims 8 and 12 are distinguished over the cited art for at least the same reasons as discussed above with regard to claim 1. Accordingly, Applicant respectfully requests that the obviousness rejection with regard to claim 8 and 12 be withdrawn.

No other objections or rejections were set forth in the Office Action.

F.   Conclusion

Applicant notes that this response does not discuss every reason why the claims of the present application are distinguished over the cited art. Most notably, applicant submits that many if not all of the dependent claims are independently distinguishable over the cited art. Applicant has merely submitted those arguments which it considers sufficient to clearly distinguish the claims over the cited art.

In view of the foregoing, applicant respectfully requests the Examiner's reconsideration and allowance of claims 1-10, 12, 14-16 and 50-54 as amended and presented herein.

In the event there remains any impediment to allowance of the claims which could be clarified in a telephonic interview, the Examiner is respectfully requested to initiate such an interview with the undersigned.

Dated this 11th day of September 2007.

Respectfully submitted,

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